DOCUMENT RESUME

ED 309 799 JC 890 367

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TITLE A Comparison of Community College Responders and Non-Responders to the VEDS Student Follow-Up Survey.
PUB DATE Apr 87
NOTE 20p.; Paper presented at the Annual Conference of the American Educational Research Association (Washington, DC, April 24-28, 1987). Funded in part by the Massachusetts Department of Occupational Education.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Graduates; Community Colleges; *Followup Studies; *Outcomes of Education; *Research Problems; State Surveys; *Statistical Bias; Student Attitudes; Student Characteristics; Two Year Colleges; Two Year College Students; Validity; *Vocational Followup
IDENTIFIERS *Massachusetts; *Vocational Education Data System

ABSTRACT

In September 1984, a Vocational Education Data System (VEDS) follow-up survey was conducted of all 5,267 students who had graduated from Massachusetts public community colleges in 1982-83. Of these graduates, 1,881 (35.7%) returned the survey, and 3,386 (64.3%) did not. A subsequent study was conducted to compare the characteristics of survey respondents and non-respondents. A random sample of 380 of the non-respondents was drawn, and telephone interviews were completed with 201 individuals. The interviews focused on graduates' reasons for not returning the VEDS questionnaire; the degree and program they had pursued; their sex, age, ethnic background, and location of college; their evaluation of their academic program and job preparation; their employment and educational status; the relationship between their job and education; and their salary. Study findings included the following: (1) the most common reason for not completing the mailed survey was that it was never received; (2) no significant differences were found between the VEDS respondents and non-respondents in terms of degree pursued, program, sex, ethnic origin, ratings of academic training or quality of occupational preparation, or employment or educational status; (3) 12% of the non-respondents identified themselves as economically disadvantaged or as having other special needs, compared to 2.6% of the respondents; and (4) non-respondents had significantly higher average wages than respondents, especially among graduates working in a field related to their training. Based on study findings, it was concluded that, if biased, the VEDS was biased in the direction of under-estimation of outcomes rather than over-estimation. Twenty-three tables are included. (AYC)

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A COMPARISON OF COMMUNITY COLLEGE RESPONDERS AND NON-RESPONDERS TO THE VEDS STUDENT FOLLOW-UP SURVEY

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Abstract

This study compared a random sample of non-reponders (N=380) to the VEDS student follow-up survey to responders (N=1881) for 15 community colleges. The study was conducted because positive follow-up results for community colleges were challanged by officials due to response rates (35.4%) and possible response bias.

No significant differences were found between responders and non-responders on 6 VEDS demographic and 4 VEDS dependent variables. Significant difference were found between responders and non-responders on special needs and work force status, hourly wage of all graduates employed and those graduates employed full-time in their area of training. All significant differences were in favor of the non-responders. Therefore, if biased, the responder data is biased in the direction of under-estimation rather than over-estimation. A model was developed to explain these results and results are discussed in terms of the model, VEDS, and other surveys.

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Paper presented at the 1987 annual conference of the American Educational Research Association, April 24-28, Washinton D.C.

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Problem Statement

The Vocational Education Data System (VEDS) in some form is one of the major sources of information for monitoring the impact of federal funds allocated for vocational education under PL94-482 and for assessing vocational educational trends nationally, locally, and at the state level. In most states, two years of student follow-up data is currently available from the VEDS system. The results of these follow-up studies have ranged from very positive to very negative both nationally and at the state level. Clear interpretation of these follow-up results have been difficult due to a number of factors, among which are response rates and the degree to which the results for graduates who return VEDS follow-up surveys are similiar to those who do not.

Not a great deal is known about factors that influence survey response rates at the post-secondary level, or about the similarity of responders and non-responders in post-secondary surveys. Even less is known about the factors that influence responses to the nationally mandated VEDS student follow-up survey, or about the similarities of VEDS responders and non-responders (Morgan, 1985). Given the major uses of the VEDS student follow-up data, providing some preliminary answers to these two outstanding general questions would be important to both researchers and decison-makers. The purpose of the present study, therefore, was to assess the degree to which post-secondary VEDS student follow-up responders were similar to non-responders in Massachusetts. Answering these two outstanding questions became relatively important in Massachusetts as the results of two consecutive VEDS surveys at the post-secondary level were so

positive as to be queried by both local and state-level decision makers due to the respondent rates (35.7%) which were excellent comparatively for this type of survey.

Methodology

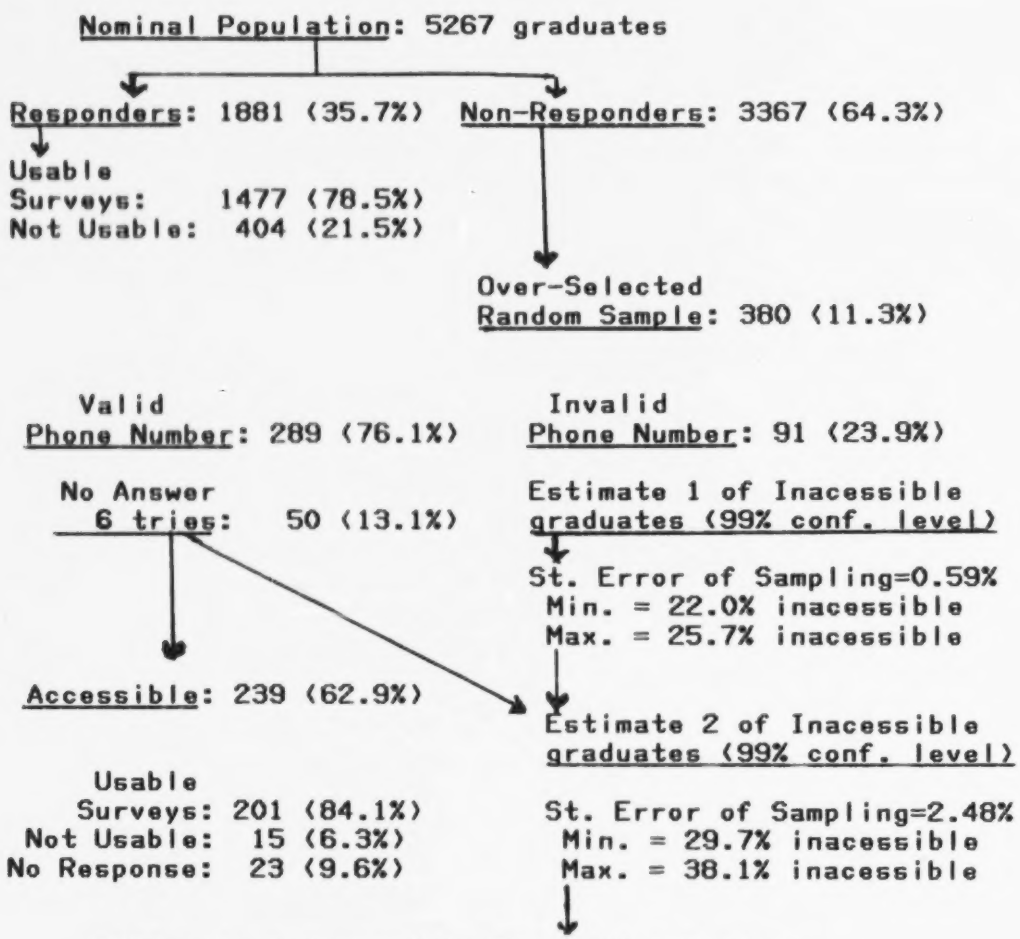
There are 15 public community colleges in Massachusetts which offer over 40 different career (occupational educational) programs. In September of 1984, a VEDS student follow-up survey was mailed to all 1982-1983 public community college career program graduates (N = 5,267). Of these graduates, 1,881 (35.7%) returned surveys and 3,386 (64.3%) did not.

For comparative analyses between the group of graduates who return the survey ("responders") and the group of graduates who did not return the survey ("non-responders"), the non-responder group would have to be at least 10% of the size of the responder group. To ensure that data on at least 189 non-responders (10%) would be available, a random sample of 380 non-responder names were generated using the random case selection procedures in SPSS.

Each of the 380 non-responder's last known address was used to obtain telephone numbers. Valid telephone numbers were found for 289 subjects (76.1%). Over a three day period, up to six attempts were made to contact each subject by phone with at least two of the attempts made after 6:00 pm. In total, 239 of the non-respondent random sample were reached by telephone for the follow-up survey interview (see Table 1).

Of the 239 non-responders contacted, 4 (1.7%) refused to participate, and 34 (14.2%) did not provide sufficient information to complete the survey for a variety of reasons. The criteria used to

Table 1: NOMINAL AND EFFECTIVE POPULATION, SAMPLE, AND RESPONSE RATE PERCENTAGES AND ESTIMATED PERCENTAGES



(Effective) Accessible Population Estimates

	Estimate 1		Estimate 2	
	N	% Nominal	N	% Nominal
minimum	3919	74.3%	3260	61.9%
average	4008	76.1%	3312	62.9%
maximum	4108	78.0%	3703	70.3%

Effective Respondent Response Rate Estimates

	Estimate 1 (Minimum)	Estimate 2 (Maximum)
minimum	45.8%	50.7%
average	46.9%	56.2%
maximum	48.8%	57.7%

Table 2: RANDOMLY SAMPLED NON-RESPONDERS STATUS BY SEX

	Female	Male	Total
Initially Selected	234	146	380
Invalid Phone Number/Address	63	28	91
No answer any of 6 times phoned	19	31	50
Did Not Call Back for Interview	10	9	19
Refused to be interviewed	2	2	4
Provided Incomplete Data	10	5	15
Completed Telephone Interview	130	71	201

Table 3: REASONS GIVEN BY SAMPLED NON-RESPONDERS FOR NOT RETURNING MAILED SURVEY

Reason	N	%
Forgot	31	14.4%
Did not want to complete survey	12	6.0%
Misplaced survey	26	12.9%
Did not like survey	1	0.5%
Did not like their community college	2	1.0%
Did not understand survey	0	0.0%
Was not employed	2	1.0%
Never received survey	103	51.2%
Mailed survey back	24	11.9%
Total	201	100.0%

Table 4: ORIGINAL RESPONDENTS EFFECTIVE RESPONSE RATE ESTIMATES

	Nominal Population	Estimate 1 (Minimum)	Estimate 2 (Maximum)
Survey Responders	35.7%	46.9%	56.8%
Usable Surveys	28.0%	36.9%	44.6%

judge the completeness of the interview-survey were the same as were used for the mailed survey; namely, that the respondent provided enough information so that her/his sex, ethnic origin, current employment status, hourly wage, number of hours worked per week and standard occupational classification could be determined. Use of these criteria in determining usable surveys in a requirement of the VEDS system and VEDS reporting. A total of 201 (84.1%) complete phone surveys were obtained within three months of the mailed survey (see Table 2).

The telephone interview used was derived directly from the written survey that was mailed to all career program graduates. Items on the written survey which were not directly relevant to the present study (e.g., "Were you employed during your enrollment at our college?") were not included in the telephone interview. Six items not on the written survey were added to the telephone interview to find out why subjects had not responded to the written survey. Telephone interviews were conducted by 3 different interviewers who were trained by an interviewing coordinator. Interviews generally took 5 approximately minutes to complete.

Results

One of the central arguments and findings in this study is that the results of the community college (post-secondary) survey must be evaluated in terms of the nominal population surveyed and the effective accessible population that is able to respond to the survey. This concept is absent in the classical theoretical literature on survey research and survey methodology, which assumes that the nominal response rate is the effective response rate and

that low nominal response rates indicate biased sampling and biased results, usually in the positive direction.

Using this accessibility concept, a high of 38.1% of the nominal population was estimated to be inacessible from the data in this study (see Table 1). Using this estimate (see Table 4), the effective response rate for the original survey (N=1881) was 56.8% as opposed to 35.4% (the nominal response rate). The factors that affect accessibility (age, job mobility, schooling, migration, the mail and so on), and thus the size of the effective population, moreover, appear from the data to be operating randomly, particularly as a net effect. Therefore, the responder sample empirically appears to be a random sample at the aggregate level. This view is further supported by non-respondents' reasons for not responding and the comparative results between responders and non-responders (see Table 5 for a summary of all analyses), and various population values that were available (degree level, program, and sex).

Of the 201 valid non-responders, 103 (51.2%) claimed that they had not received the mailed survey (see Table 3) and 24 (11.9%) claimed that they had returned the survey by mail. What percentage of these 127 subjects were giving socially acceptable answers could not be determined, but the combined percentage of these two categories (63.1%) closely agrees with the accessibility percentage derived and given in Table 1 (62.9%). Thirty-one non-responders (14.4%) said they had simply forgotten to complete the survey and 24 (25%) said that they had misplaced the survey. Only 2 (1%) of the non-responders said that they did not want to answer the survey and only 2 (1%) said that they did not want to answer the survey because they were unemployed.

Table 5: SUMMARY TABLE OF RESULTS

Variable	Test	Value	df	p
1. Degree Pursued	Chi Sq.	7.90	6	>.05
2. Program Pursued	Chi Sq.	11.33	10	>.05
3. Sex	Chi Sq.	1.03	2	>.05
4. Ethnic Background	Chi Sq.	2.44	4	>.05
5. College Location	Chi Sq.	0.06	1	>.05
6. Quality of Academic Program	F-test	0.00	1,1676	>.05
7. Quality of Job Preparation	F-test	1.75	1,995	>.05
8. Employment Status	Chi Sq.	1.91	1	>.05
9. Current Educational Status	Chi Sq.	0.90	1	>.05
10. Age in Years	F-test	7.71	1,1665	<.01*
11. Age by Categories	Chi Sq.	8.20	5	>.05
12. Special Needs Status	Chi Sq.	44.10	3	<.001*
13. Work Force Status	Chi Sq.	16.20	5	<.001*
14. Job Relatedness	Chi Sq.	21.60	3	<.001*
15. Hourly Wage full and part-time	F-test	5.53	1,1462	<.02*
16. Hourly wage full time in area of training	F-test	7.25	1,960	<.007*
17. Hourly wage full time not in area of training	F-test	0.01	1,213	>.05

Table 6: DEGREE PERSUED BY STUDY GROUPS

Degree Level	Population N	Population %	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Associate	5062	96.1%	1429	96.7%	193	96.0%
Certificate	111	2.1%	27	1.8%	7	3.5%
Diploma	68	1.3%	11	0.7%	1	0.5%
Other	26	0.5%	10	0.8%	0	0.0%
Total	5267	100.0%	1477	100.0%	201	100.0%

Comparisons	Chi-Square	df	p
Responder to Non-responder	3.92	3	>.05
Responder to Population	4.16	3	>.05
Non-Responder to Population	3.66	3	>.05
All three	7.90	6	>.05

Table 7: TWO DIGIT OE CODE PROGRAM AREA BY STUDY GROUPS

Two Digit Program Area	Population N	Population %	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Services	179	3.4%	41	2.8%	8	4.0%
Medical/Health	1377	26.1%	374	25.3%	53	26.4%
Child Care/Food	153	2.9%	36	2.4%	8	4.0%
Sec./Business	2073	39.3%	662	44.8%	72	35.8%
Technology	1282	24.3%	326	22.1%	55	27.4%
Production/other	169	3.2%	38	2.6%	5	2.4%
Total	5267	100.0%	1477	100.0%	201	100.0%

Comparisons	Chi-Square	df	p
Responder to Non-responder	8.44	5	>.05
Responder to Population	8.10	5	>.05
Non-Responder to Population	3.05	5	>.05
All three	11.33	10	>.05

Table 8: SEX BY STUDY GROUPS

Sex	Population N	Population %	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Female	3550	67.4%	1006	68.1%	130	64.7%
Male	1717	32.6%	471	31.9%	71	35.3%
Total	5267	100.0%	1477	100.0%	201	100.0%

Comparisons	Chi-Square	df	p
Responder to Non-responder	0.91	1	>.05
Responder to Population	0.23	1	>.05
Non-Responder to Population	0.55	1	>.05
All three	1.03	2	>.05

Table 9: ETHNIC BACKGROUND BY STUDY GROUPS

Ethnic Background	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
White	1435	97.2%	193	96.0%
Hispanic	13	0.9%	2	1.0%
Black	18	1.2%	5	2.5%
Asian	2	0.1%	0	0.0%
American Indian	9	0.6%	1	0.5%
Total	1477	100.0%	201	100.0%

Chi-Square= 2.44 (df=4, p.>.05)

Table 10: SPECIAL NEEDS STUDENTS BY STUDY GROUPS

Special Needs Status	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Disadvantaged	15	1.0%	17	8.5%
Limited English	10	0.7%	2	1.0%
Handicapped	11	0.7%	0	0.0%
Other	3	0.2%	5	2.5%
Total	39	2.6%	24	11.9%

Chi-Square = 44.1 (df=3, p.<.001)

Table 11: COLLEGE LOCATION BY STUDY GROUP

College Location	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Urban (n=11)	1224	82.3%	168	83.6%
Rural (n=4)	253	17.7%	33	16.4%
Total	1477	100.0%	201	100.0%

Chi-Square = 0.06 (df=1, p.>.05)

Table 12: RATING OF THE QUALITY OF ACADEMIC PREPARATION BY STUDY GROUP

Group	N	Mean	St. Dev.
Responders	1477	3.96*	0.77
Sampled Non-Responders	201	3.97	0.80
Total	1678	3.96	0.77

*rating could range from 1 (poor) to 5 (excellent)

	SS	df	MS	F	Om.Sq	p.
Between Groups	0.001	1	0.001	0.002	0.0	>.96
Within Groups	989.7	1676	0.59			

Table 13: RATING OF THE QUALITY OF JOB PREPARATION BY STUDY GROUP (COMPLETED ONLY BY THOSE EMPLOYED FULL-TIME IN THEIR AREA OF TRAINING).

Group	N	Mean	St. Dev.
Responders	842	3.98*	0.87
Sampled Non-Responders	115	3.87	0.94
Total	957	3.97	0.88

*rating could range from 1 (poor) to 5 (excellent)

	SS	df	MS	F	Om.Sq	p.
Between Groups	1.3	1	1.3	1.75	0.0	>.05
Within Groups	731.2	955	0.8			

Table 14: EMPLOYMENT STATUS BY STUDY GROUP

Status	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Employed	1282	86.8%	182	90.5%
Not Employed	195	12.2%	19	9.5%
Total	1477	100.0%	201	100.0%

Chi-Square = 1.91 (df=1, p.>.05)

Table 15: WORKFORCE STATUS BY STUDY GROUPS

Current Employment Status	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Employed	1282	86.8%	182	90.5%
In Military	5	0.3%	0	0.0%
Unemployed Seeking	62	4.2%	12	6.0%
Unemployed not Seeking	25	1.7%	0	0.0%
Not in Labor Force	103	7.0%	7	3.5%
Total	1477	100.0%	201	100.0%

Chi-Square = 16.2 (df=5, p.<.001)

Table 16: CURRENT EDUCATIONAL STATUS BY STUDY GROUP

Current Educational Status	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Attending School	446	30.2%	54	26.9%
Not Attending School	1031	69.8%	147	73.1%
Total	1477	100.0%	201	100.0%

Chi-Square = 0.94 (df=1, p.>.05)

No significant differences between responders and non-responders were found in terms of degree level pursued (see Table 6), program (Table 7), sex (Table 8), ethnic origin (Table 9), or type of college (Table 11) attended (urban or rural). The two groups did differ significantly in terms of mean age ($F=7.17$, $df=1,1665$, $p<.01$, omega squared=0.4%), with the responder group being older than the non-responder group by about 1 year (28.8 versus 27.6 years old). There were no significant differences in terms of the frequencies in the age categories typically used to analyze this data at the post-secondary level (Table 21). There was a statistically significant difference ($p<.01$) in the percentage of special needs students in each of the two groups (Table 10). Almost 12% of the non-responder group identified themselves as special needs (primarily economically disadvantaged) students as compared to only 2.6% of the responder group.

No statistically significant differences were found between responders and non-responders in terms of their ratings of the academic training they had received at their college (Table 12), or in terms of the quality of their occupational preparation (Table 13). Responders, however, tended to rate their occupational preparation slightly higher than non-responders.

There were no statistically significant differences in the ratio of graduates who were employed versus unemployed in the two groups (Table 14). In terms of the non-working categories, responders were more likely ($p.<.01$) to place themselves either in the "not in the labor force" (7%) or "not seeking employment" (2%) category, while non-responders were more likely to place themselves in the "seeking employment" (4%) category (Table 15).

Table 17: EMPLOYED GRADUATES ONLY: JOB RELATEDNESS TO AREA OF TRAINING BY STUDY GROUPS

Job Relatedness	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
Directly Related	776	60.5%	107	58.9%
Somewhat Related	247	19.3%	26	14.3%
Remotely Related	73	5.7%	2	1.2%
Not Related	186	14.5%	47	25.6%
Total	1282	100.0%	182	100.0%

Chi-Square = 21.6 (df=3, p.<.001)

Table 18: HOURLY WAGE IN DOLLARS OF FULL AND PART-TIME EMPLOYED GRADUATES BY STUDY GROUPS

Group	N	Mean	St. Dev.
Responders	1282	7.40	2.66
Sampled Non-Responders	182	7.90	2.74
Total	1464	7.46	2.67

	SS	df	MS	F	Om.Sq	p.
Between Groups	39.37	1	39.37	5.53	0.36	<.02*
Within Groups	10401.16	1462	7.11			

Table 19: HOURLY WAGE IN DOLLARS OF GRADUATES WORKING FULL-TIME IN A FIELD RELATED TO TRAINING BY STUDY GROUPS

Group	N	Mean	St. Dev.
Responders	847	7.67	2.39
Sampled Non-Responders	115	8.32	2.61
Total	962	7.75	2.42

	SS	df	MS	F	Om.Sq	p.
Between Groups	42.29	1	42.29	7.25	0.74	<.007*
Within Groups	5597.60	960	5.83			

There were no statistically significant differences between the two groups in terms of current school attendance (Table 16). Between one quarter and one third of the graduates in each group were currently enrolled in school. The two groups did differ ($p.<.01$) in terms of the degree to which their current job was rated as being related to their field of training (Table 17). Subjects in the responder group were more likely ($p<.01$) to have a job in an area which they rated as either directly or somewhat directly related to their field of training.

In terms of average hourly wage, there were statistically significant differences ($p<.01$) between the two groups (Table 18). Overall, the responder group averaged $7.40 per hour and the non-responder group averaged $7.90 per hour. This effect was linear by sex (Table 23) However, a more detailed analysis of average hourly wage for graduates working in an area related to their training (Table 19) indicated that the non-responders reported earning an even higher ($p<.007$) average hourly wage ($8.32) than responders ($7.67). This pattern of higher average hourly wages for non-responders than responders was also found in each of seven broadly defined program areas (Table 22).

There were no significant differences in average hourly wages between responders and non-responders who were not employed in a field related to their training. Responders reported earning $6.84 per hour, while non-responders reported earning $6.81 per hour. Further detailed analyses and reports on these data are also available (see Carifio and Shwedel, 1983 and Carifio, Biron, and Shwedel, 1984).

Table 20: HOURLY WAGE IN DOLLARS OF GRADUATES WORKING FULL-TIME IN A FIELD NOT RELATED TO TRAINING BY STUDY GROUPS

Group	N	Mean	St. Dev.
Responders	174	6.84	2.77
Sampled Non-Responders	41	6.81	2.67
Total	215	6.84	2.74

	SS	df	MS	F	Om.Sq	p.
Between Groups	0.03	1	0.03	0.01	0.0	>.05
Within Groups	1608.53	213	7.55			

Table 21: AGE (CATEGORIES) BY STUDY GROUPS

Age Categories	Responders N	Responders %	Sampled Non-Responders N	Sampled Non-Responders %
22 and younger	353	23.9%	42	20.9%
23 to 27	524	35.5%	88	43.8%
28 to 33	237	16.0%	34	16.9%
34 to 39	185	12.5%	21	10.4%
40 to 45	86	5.8%	10	5.0%
46 and above	80	5.4%	5	2.5%
Missing data	12	0.8%	1	0.5%
Total	1477	100.0%	201	100.0%

Chi-Square = 8.2 (df=5, p.>.05)

Table 22: HOURLY WAGE BY DEGREE PROGRAM AREA FOR GRADUATES WORKING FULL-TIME IN AREA OF TRAINING BY STUDY GROUPS

Two Digit Degree Program Area	Responders N	Responders Mean	Responders SD	Sampled Non-Responders N	Sampled Non-Responders Mean	Sampled Non-Responders SD
Services	25	8.91	3.65	8	8.99	2.76
Medical/Health	237	8.20	1.69	33	8.79	2.25
Child Care/Food	18	4.90	1.23	5	5.12	1.76
Sec./Business	385	7.08	2.35	43	7.79	2.05
Technology	165	8.69	2.46	24	9.58	2.93
Production/other	19	8.94	3.09	2	10.25	6.71
Total	847	7.67	2.30	115	8.32	2.61

Table 23: HOURLY WAGE BY SEX BY STUDY GROUP (2X2 ANOVA)

	Females			Males		
Study Group	N	Mean	SD	N	Mean	SD
Responders	1006	6.21	3.18	471	6.89	4.12
Non-Responders	131	6.90	3.30	70	7.56	3.88
Total	1137	6.29	3.20	554	6.98	4.10

	SS	df	MS	F	Qm.Sq.	p.
Study Group	82.4	1	82.4	6.7	0.8	<.01*
Sex	169.7	1	169.7	13.8	0.4	<.001*
Group by Sex	0.01	1	0.01	0.0	0.0	>.05
Error	20627.2	1674	12.3			

Discussion

As the wage data is considered to be the most important and critical data in the VEDS follow-up survey, the data from this study which included non-responders from 15 colleges and over 40 different programs tends to indicate that the data obtained from responders to the VEDS survey at the college level tends to be reasonably representative of the population of occupational program graduates. Furthermore, if biased, the responder data is biased in the direction of under-estimation rather than over-estimation. Decision makers, therefore, may be reasonably confident in the representativeness of the information the VEDS survey generates at the college level, even when the nominal response rates are as low as 25% to 35% of the population which they normally tend to be.

A model was presented to explain and support these findings. The nominal versus effective accessible population concept and model presented was supported by the results of this study. Based upon the results of this study, challenges to the representativeness of the VEDS student follow-up survey results at the college level would not seem to be empirically supported. Systematic biases in results between responders and non-responders were not found for the key variables in the VEDS system at the college level across 15 colleges and 40 occupational programs. The nominal versus effective accessible population model and theoretical concept developed, therefore, would seem to be both a sound and useful concept, particularly as the kinds of problems inherent in the VEDS community college follow-up survey are present in all kinds of dynamic longitudinal surveys and studies. Replication of this study would be useful to both strengthen and cross-validate its findings on these

important field research questions.

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Acnowledgement

This research was supported in part with funds provided by the Massachusetts Department of Occupational Education.

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